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## NEGLECTED FACTORS IN THE PROBLEM OF NORMAL INTEREST

### SUMMARY

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By no means all of the points considered in this paper deserve the appellation of "neglected"; but in attempting to present some that do seem to merit more notice than they have received, it seems advantageous to give them a setting in a somewhat systematic view of interest theory, even tho the procedure involves a certain amount of restatement of familiar matter. In a study covering so large a field, moreover, there can be no thought of definitely separating the new from the old, or giving credit for the latter portion where it is due. This may serve to excuse its manifest critical and historical shortcomings.

A systematic discussion of the interest problem falls naturally into four parts, relating respectively to the nature of capital and to the conditions of its supply, its demand, and of equilibrium between the two. About all of these issues controversy has raged, nor can agreement be claimed today in regard to a single one of them. This study, which presents a method of attack avoiding some of the most important confusions and occasions of misunderstanding and disagreement, is submitted in the hope that it may make some small contribution toward realizing in this troubled field the grand desideratum in economic theory, a body of sound and accepted doctrine in the fundamentals of the science.

## I. THE NATURE OF CAPITAL

As a means of side-stepping the endless controversy on this head, we propose to define capital in pragmatic fashion, with reference to the problem in which we are interested. Capital, then, is *that for the use of which interest is paid*, and the proper way to get an understanding of its nature is to examine the function in the industrial world of the institution of lending at interest.

In the first place, it is clear that no such procedure as lending at interest is inherently necessary to the conduct of the production, distribution and consumption of wealth under the competitive conditions of highly developed society. Every business operation might be carried on, with a difference in the forms alone, by the purchase and sale, or rental, of actual productive property. With the exception of the inconvenience and loss involved, every detail of the production and exchange of commodities might be as we see it today without an interest contract in the world.

Why do men lend their "money" instead of buying or constructing productive agents and renting these to business men? It is for the same reason that they do not so acquire productive property and operate it themselves, thus becoming entrepreneurs on their own account. The ownership of concrete forms of property involves both close study of the business situation and responsible business action. The same motives which lead to the one differentiation of function, the renting of productive agents instead of operating them in person, lead to the other, the transfer of ownership as well as management, to the same entrepreneur. The individual who fixes wealth in a definite form largely determines the use to which it is to be put, and is one of the principal responsible directors of the productive system as a whole. He must put forth the effort to acquire the necessary knowledge as to the relative commercial prospects of the different available uses, and then must take the consequences, for good or for ill, of "committing" it to the form and use decided upon. He determines the character of productive operations and takes the "risk" <sup>1</sup> involved; he is an entrepreneur.

The institution of lending capital at interest exists, therefore, for the purpose of carrying as far as possible the specialization of the entrepreneur function.<sup>2</sup> This

<sup>1</sup> Risk is not a good word, because of its use in connection with insurance, an entirely different sort of thing. Its use to designate the entrepreneur function is doubtless both cause and effect of the confusion which reigns in regard to the theory of entrepreneurship and profit. "Responsibility" is a better word, as it does not convey the idea of a known chance, with which the insurance company but not the entrepreneur is concerned, but of a decision involving uncertainty, and the consequences of which must be taken by the one who makes it.

<sup>2</sup> The specialization is not perfect, even then, for two reasons. First, some property has to be the security for the return of the loan, and hence the use to which the capital is put is not a matter of complete indifference to the lender. He must still keep an eye upon the borrower and his business (management) and assume corresponding chance of loss (responsibility); he is still entrepreneur to that extent. Second, practical exigencies demand that the loan be arranged definitely for a considerable period of time.

view reveals at once the practical nature of capital, the thing lent. It is a *claim or title to a fixed amount of wealth, not involving the ownership of any particular piece or kind of property*. In the strict sense, *capital is value*. It may be embodied in anything having value, and conversely anything possessing value may represent that much capital. The owner of any concrete property owns capital to the extent of its market value at the moment; this is the amount he is free to withdraw for other uses, and the amount he can lend to another business man not interested in that particular form of enterprise. But as a matter of convenience in making transfers (the purpose for which capital exists) it will usually be embodied in money or bank credit. Moreover, since value is necessarily measured and expressed in terms of money, and since the term money is loosely used in everyday speech as a synonym for wealth in general, no confusion need arise from thinking of capital as money. It must of course be money in this loose popular sense and not in the technical meaning of the circulating medium. There is just one limitation necessary; capital is money, or wealth, or value, thought of in its loan aspect.<sup>1</sup>

Capital being merely wealth in general, interest is the income from a loan of a claim to a certain amount of

Here again the lender exercises judgment and takes responsibility with reference to changes in conditions in the interim. Such a time contract in fact becomes property, subject to fluctuations in value, as seen in even the best corporation and government bonds. The only lender who is purely a capitalist is the lender "on call" at absolute security, if any such lender exists. He alone can get back the original amount of "value" at will.

<sup>1</sup> There is of course abundant precedent for this formulation of the capital concept. Thus Professor Fetter is at least very near it in, "economic wealth whose quantity is expressed in a general value unit" (See this Journal, vol xv, p 44) Mr F. B. Hawley, too, has called capital "unexpended purchasing power," a polysyllabic name for plain "value" (Enterprise and the Productive Process, p 5) Again, this is clearly what is meant (though not said) by Professor J. B. Clark, who considers it as a sort of metaphysical essence persisting through changing material forms. This implication of Clark's phraseology has been pointed out by various writers, as by Fetter in the article referred to. Both the leading schools of interest theorists are divided on the subject, Fisher and Böhm-Bawerk on the one hand, and Carver on the other, insisting that capital consists of concrete productive agents.

value, as distinguished from the income of any piece of actual property. The income of a particular piece of property is called rent. From the standpoint of many problems, rents may profitably be classified according to certain characteristics of the agents to which they accrue, particularly their durability. Professor Marshall has called the income from the less durable agents "quasi-rents," but the distinction is necessarily shifting and arbitrary, and more complex classifications are doubtless useful for special purposes. From the standpoint of the interest problem, the only distinction of significance is that between the income of *any* piece of property as such and that of a loaned claim on a certain *amount* of unspecified wealth; the one is rent, and the other interest.

Under the impossible conditions of ideally perfect competition,<sup>1</sup> where time and space were annihilated and universal omniscience prevailed, the two incomes would be equal; the rent on any agent would be the same as the interest on its value. But under any real or possible circumstances there will be a normal difference between rent and interest, constituting the income (profit) accruing to the entrepreneur function of fixing or "committing" value.

## II. THE SUPPLY OF CAPITAL

Our concern under this head is not of course the amount of value or wealth in existence, but the supply available for lending, the amount offered on the loan market. Two questions must be dealt with, (1) the

<sup>1</sup> Not necessarily the "static state" of Professor J B Clark and others. Perfect competition would indeed exist in the static state, but because static conditions involve perfect knowledge of the situation by all competitors. It is the fact of omniscience, however, which is the prerequisite to perfect competition, and if this were realized in any other manner, no amount or kind of change would disturb the operation of ideal economic law. Changes foreseen in advance are discounted or capitalized in advance, and are a part of the static situation to which business men adjust their conduct.

*diversion* of wealth from other uses (immediate consumption) to the loan market, or *saving*; and (2) its creation or production on purpose for this use. Altho the second factor is unquestionably much the more important of the two, discussion and controversy have centered mainly around the first. It seems to be assumed that an offer to lend involves only the question of when consumption is to take place, whereas in fact the larger part of capital by far is certainly the result of other motives than the desire to consume (merchantable) commodities at any time.

(1) It may be that an appreciable amount of capital results from the conscious postponement of consumption; no doubt some does originate in this way, tho the relative significance of this source must be a matter for grave doubt. But for its historic interest, if for no other reason, some notice must be given to the notorious problem of whether men "discount the future." The question has suffered much from lack of proper statement. When correctly formulated, a definite answer will be found to be neither possible nor, if it could be obtained, of any particular significance for the theory of interest. It can be intelligently discussed, like most scientific questions, only on the expressed or implied supposition that "other things are equal." "Other things equal," it would seem to be largely a question of human rationality, as it is hard to see how a rational being can be influenced by the mere time of an occurrence. This must give us a bias in favor of rationality, in case of doubt, such an assumption being necessary to intelligent discussion of human conduct in the light of motives. Of course savages and children are lacking in foresight, and recklessly improvident; but could competitive industry (not to mention economic science) be built on the basis of such behavior? The way the

question is generally asked, other things are anything but equal. If it is suggested that I postpone this year's consumption of food until next year, the difference in "other things" is considerable, inasmuch as I should be alive now and dead then; in other words, the alternative is non-existent. It goes without saying that many things must be taken when they are offered, the pleasures of life enjoyed while we live and those of youth while we are young, or not at all.

In order to afford a basis for an intelligent guess on the question of time-preference in consumption, it may be worth while to suggest a situation in which other factors than time should be as nearly as possible eliminated. We may without doing violence to reality overlook the inevitable chance of death, as it is no doubt virtually ignored by most people in the prime of life and with reference to moderate intervals of time. Let us then, imagine a man in good health stranded on a desert island with slightly less than a comfortable supply of food to last one year, at the end of which time we suppose him to know that a ship will pass by and take him off. Would a rational man or the "average" man, gormandize in the early part of the period to starve at its close? I submit that the ordinary human being would distribute his rations with painstaking uniformity. He might take occasional spurts of recklessness and parsimony respectively, but on the whole he would be at least as likely to favor the latter end of the interval as the earlier.

But we need not appeal to imaginary situations. How *does* the normal individual apportion his enjoyment, including his leisure, throughout life, when free to choose? Does he exhaust the resources of credit and insurance in anticipating his future earnings so as to live high in his younger years to skimp and slave in



age if it come ? Has anyone heard of a considerable demand for annuities decreasing with advancing time ? What proportion of individuals buy even regular life annuities ? The significant thing in the capital market is the psychology of the social class from which capital accumulations actually come. Our large producers, who are to a still greater degree our large savers, not only do not buy annuities, but invest enormous sums in life insurance. They not merely invest the bulk of their income in perpetual income property, but they habitually reinvest a large part of the return from these investments in the same way, and so on, postponing consumption perpetually. If it were a question of time-discount at all (which it is not), we should have to say that these people discount the *present* and at a prodigious rate.

The truth is that economists blind themselves to the facts in applying the ordinary economic motives, the motives of the drudge at the margin of subsistence, in the field of capital at all. Here production is not in order to consumption, but if anything the other way. The thing desired is *possession*, which is a categorically different proposition. The motivation is not economic in the ordinary sense but "sociological."

But, whatever might happen if other things were equal, they are not equal. It is possible to invest surplus value product and secure an income from it, and it may be of interest to note the bearings of this fact on time-value calculations — if any are ever carried out. Whatever would be the natural distribution of consumption without interest, those who make such calculations will shift their consumption forward from the "natural" just as far as the reward offered seems to them to justify. By giving to a skilled actuary his psychological estimate of the disutility of distortion of his

income-flow, measured in terms of its total quantity, one could find out just what kind of an annuity to buy to secure the maximum *ophelimité*. But is this shift, or the fact that it stops when it does, an evidence of future discount? Who would not prefer a dollar today to one a year hence to the extent of five cents, when he could invest the dollar in gilt-edge securities at that rate? Time-preference must be measured from a basis of uniformity of distribution of consumption in time. To attribute interest to the discount of the future is (among other worse errors) to commit the fallacy of interchanging cause and effect.<sup>1</sup>

So much for the mere fact of time value in consumption. The next point which calls for emphasis is that the whole question can have nothing or next to nothing to do with the social supply of capital. Economists have a way of jumping from the inward soul of man to social behavior with an uncritical precipitateness which is always perilous, and which here leads to the gravest errors. It would seem obvious, on mere statement, that *no* distribution of consumption in time on the part of the individuals composing society can lead to a net accumulation of capital in the society as a whole. Net accumulation can only result from an average excess

<sup>1</sup> I regret the impossibility of extended critical references at this point. The position taken will be found more or less clearly indicated in many writers, especially Carver, Davenport, and Taussig, tho all three conclude by admitting the validity of the time-value phraseology. The trouble seems to be with the definition of property as future goods. This is true "in a way," but the relations are not so simple, "future income" does not necessarily mean "anticipated consumption." The question will receive further notice presently.

The failure to take uniformity of distribution as a basis of reckoning seems to underlie the peculiar outcome of Bohm-Bawerk's tables (Positive Theory, Bk. V, ch. 4) of which Professor Fisher has made so much (Rate of Interest, ch. 4). It is neither true nor false, but simply unmeaning, to say, as Bohm-Bawerk so often does, that "present goods are as a rule worth more than future goods of like kind and number." One is reminded of the tramp, who finding a hundred-dollar bill, made a bee-line to the nearest quick lunch and excitedly ordered a hundred dollars' worth of ham and eggs! There is no question of the relative value of seven dinners according to which day of the week all are to be eaten. Professor Fisher rightly recognizes that the time-shape of the income-stream is the significant matter.

of production over consumption in the individual lives as units.<sup>1</sup> It is for the individual a question of discounting not merely present to future, but his own consumption to that of others. A progressive society may be said to discount the present, perhaps, tho the significance of the assertion is doubtful. The motives of net accumulation and those of postponement of consumption are categorically different, tho both modes of conduct would be likely to result from the dominance of the same temperament.

Here again the neglected field seems more significant than the one to which attention is usually given (or in with which it is indiscriminately thrown) and it may be of interest to note a few points in regard to the motives which look beyond the individual life. (We must assume a "productivity" distribution of income and suppose that each individual is free at all times to dispose of his whole product as he wills.) In a sense, any concern with the world that will be when we no longer exist may be called irrational, but it is real, and one of the most potent forces in shaping human conduct and the character of civilization.

We may distinguish three sorts of conscious motives looking beyond our own lives. (a) An interest in our post-mortem reputation or prestige. By this urge we are led to build Great Pyramids (and less imposing resting-places for our remains); to found universities bearing our names; to build (with the vainly-protesting stockholder's money) magnificent railway stations not demanded by traffic conditions but forming splendid monuments to our administration; hotels and business blocks in our home town; and the like. (b) A personal affection for and interest in survivors, children and

<sup>1</sup> In a society where capital is productive, the postponement of consumption by individuals within their own lives would, however, result in their being in existence at any moment a slightly larger amount of productive resources

other relatives, or friends. (c) Ideal interests of the most varied sort. A large part of the human race have impersonal solicitudes for things whose prosperity depends on the accumulation of wealth. These range all the way from an exalted concern for human progress down through sentimental attachments to places, institutions and the like, especially the business itself which one's life has gone to establish and build up. Both (b) and (c), it is apparent, commonly contain various admixtures of (a).

To these must be added wholly irrational grounds, hardly conscious motives at all, but probably as potent on the whole in promoting the abundance of capital as are any others. Such are the gaming spirit, social suggestion and the mere force of habit, running in the extreme case of the miser into complete obsession. Business, like other human activities, is largely a matter of emulation, imitation and rivalry. Men produce and accumulate because "others are doing it" and because it affords a measure of personal prowess and success.

(2) The question of the production of value specifically for capital uses, that never would have been produced for consumption, naturally includes most of the net saving beyond the life of the individual already discussed. Little more can be done here than to point out the existence of the general problem, and the extreme simplicity of assuming, as much discussion of the interest rate seems implicitly to do, that the amount of production and hence of consumption is fixed, and that the only alternative of choice relates to the time of consumption. Under theoretical conditions each individual produces goods up to the point of equivalence between the reward and the sacrifice connected with the last unit. Hence in any case, every increment of saving would increase the marginal utility of present

consumption (by cutting off some of it), which would always lead to the productive operation being carried farther than it would have been for the purpose of present consumption alone. Even if goods were really produced for their immediate utility and only subsequently "saved," as a sort of afterthought, the fact of saving would lead to increased total production.

Now consider that our largest producers, from whom we get a great part of the social saving (both out of their own incomes and out of other people's, through the compulsory investment of revenue in corporation property) never have in mind in connection with most of their productive activity any consumption of commodities at any time, much less in the present, but are actuated by quite other motives. The possession of wealth confers social position and gives one power over the lives and destinies of his fellows "even to the third and the fourth generation." Moreover, the very act of producing, when carried on in the competitive spirit, gives a pleasure to which sacrifices comparable to those of a prize-fighter in training are often gladly made. It is the most exhilarating game ever contrived by the combined genius of the human race and the blind forces of history. When we reflect that men are lazy and love ease far more than luxury, it is clear that an enormous portion of the total wealth production of any modern nation, and probably the larger part of that which is said to be "saved," would never have been dreamed of in connection with mere consumption uses. Even with reference to those savers who may be supposed actually to balance saving against present consumption, it is probable that, on the whole, provision for future contingencies, rather than the interest on savings, constitutes the dominant motive in their minds. Possibly the fact of interest is as likely to induce them to save

less as more.<sup>1</sup> It is a strained and highly sophisticated logic indeed which attempts to analyze the motives of capital production in terms of relative estimation of "present and future goods."

As a result of this part of our discussion, we may attempt to draw a supply curve for capital, of some degree of verisimilitude. The important point is that while the postponement of present to future consumption is at best a relatively inconsiderable source of capital, and is probably influenced very little by the rate of yield (possibly even adversely) the more important social and moral motives for the creation of capital are bound up with its return, and are, no doubt, in some rough way proportional to the rate of the latter. For these motives can be summed up in the two phrases "personal prestige" and "social power"; and the amount of both conferred by the possession of capital is obviously a direct function of its productivity. On the whole, then, we find justification for representing the conditions of the supply of capital in the conventional way, by a curve ascending as the rate increases. (See Figure 1, page 300, curve OA.) The details of the curve are of course arbitrary, the exact coincidence of the zero points of interest and accumulation being especially improbable, but the general shape probably corresponds with the facts. Even tho the securing of the interest is not the dominant motive of accumulation, the two may vary concomitantly from other causes.

Care must be taken, as we shall see, to interpret this curve correctly. It relates exclusively to a given moment of time, and shows simply what the *rate* of saving would be if the rate of interest were such-and-such. It is a purely hypothetical representation of a momentary

<sup>1</sup> A point made by different writers, notably by Professor J. B. Clark, in his *Essentials of Economic Theory*.

situation; any capital production which takes place under the conditions must change the conditions of subsequent saving and investment, as will be shown at length in Part IV.

### III. THE DEMAND FOR CAPITAL

Why do men borrow other men's titles to general wealth? The first part of the answer has been given in Part I. The reason the business man prefers to borrow "money" rather than to rent specific property is simply that it is cheaper. It is cheaper because this form of loan saves the lender the payment for the entrepreneur activity of "committing" the value to the form desired, which he is willing to perform on a narrower margin himself. But what the borrower always wants is the use of some specific form of property. The motives for desiring property need not detain us long. We know that some are spendthrifts anticipating future legacies and want to live on a grander scale than present resources allow; that others are sick or out of work or temporarily "hard up" from some other cause, and so in a different sense have the same desire; but that, completely overshadowing all such cases, in the actual loan market of any civilized society, many forms of property are aids to the production of wealth and hence desirable because sources of income to their possessors. In the typical loan at interest, the only one which we need consider, it is some kind or combination of kinds of *productive property* whose use is wanted.

The productivity of property is familiar enough in economic literature, but as there is anything but unanimity in regard to its precise meaning, a few words as to the interpretation on which the present argument is

based seem called for. This view is what is known as the "specific productivity theory," with some qualifications. It says that under an impossible system of ideally perfect competition each productive agent will get exactly that portion of the social dividend which is dependent upon its use in production. Under actual conditions, where competition is not perfect, this will be reduced to the value set upon its *anticipated* product by the entrepreneurs competing for its use, the difference between this amount and the realized product constituting the entrepreneur's profit. What is dependent upon the use of any agent is the amount that will *necessarily* be deducted from the total product of the society if it is withheld from use. That is, an agent secures nothing on the ground of the importance of the position it happens to occupy in the industrial organization. For if an agent in an important place were withheld it would immediately be replaced by the one in the least important place, that could be substituted for it.

The principal "qualification" is that we must speak of actual productive agents — one man, one machine, one mine, one plot of ground of the size which actually figures as a unit in business calculations — not of "productive factors." The process of funding rent-bearers or wage-bearers into homogeneous masses is arbitrary and illegitimate. The only true funds are composed of actually interchangeable agents, units of which really compete perfectly with each other. Now the constitution of such groups would be different for every different use and very largely a matter of degree in any case; also they would cut across labor and property lines in the most bewildering fashion, for the relations of interchangeability are hopelessly complex. Any general funding, as into capital and labor, or land,



capital and labor, is based on value productivity itself, a clear case of reasoning in a circle.

Some other misinterpretations must be guarded against. Economic productivity has no connection with either moral desert or physical causation. No agent can be more productive than any other which can be substituted for it. Hence a no-rent agent, even when used, is unproductive, for it can be replaced by one not worth using. Professor Adriance,<sup>1</sup> for example, has confused economic productivity with physical use, in a manner quite parallel to confounding utility with economic value. Productivity, like value, is a function of limitation of supply. Professor Böhm-Bawerk, again, failed to see that his own "superior effectiveness of longer processes of production" is equivalent to what is meant, in the minds of productivity theorists, by the specific productivity of the property on which those longer processes are based. Hence Professors Fisher and Fetter are right in accusing him of adopting the productivity theory of interest after refuting it, tho when we turn from the incident of terminology to the real issue involved, he is more right than they. Böhm-Bawerk, however, does not go far enough; the productivity of capital is not merely the indispensable condition of interest, it *is* the rate of interest, as we shall see.

Our problem is now reduced to showing what is meant by the productivity of capital as we have defined it, or of money loans. The productivity of rent-bearing property we may now assume as admitted, but the essence of our definition of capital is that it is *not* material property. The clue to the difficulty is in the phenomenon already frequently referred to, of the "fixing" of wealth in specific forms. A claim on wealth in general

<sup>1</sup> In the article on "Specific Productivity," in this Journal for November, 1914.

can be *converted into* the ownership of definite pieces of property. If surplus wealth or value can be transformed into something which adds a definite amount per annum to the total product of society, it must be clear that competition will impute to the capital that increase in amount as its own "product." We have now to examine the nature of this process of conversion.

Here will be seen an added advantage of a correct definition of capital. Not merely does the definition adopted, that capital is simply exchange power offered for lending, correspond to the facts of business usage, but it is essential to a theoretical solution of the interest problem. It enables us to side-step at once the whole controversy over the valuation of capital goods, for capital goods or productive pieces of property bear rent and not interest.

It will help to make clear both the meaning and the significance of the convertibility of capital and rent-bearers if we glance for a moment at a hypothetical society in which the phenomenon would not exist. A simple supposition will realize this condition. Productive wealth might not be produced at all, but might simply exist as a given quantity, entirely beyond any degree of human control, either as to its amount or quality. A primitive people with no knowledge of means of extending its productive resources may be thought of as living under a régime of private property and free exchange. Under such conditions, not only would land be rented for approximately the annual value of its products, but mere supply and demand in the market might establish a fixed rate of exchange between consumption wealth and the income-producing property.<sup>1</sup> Landowners without heirs might sell off

<sup>1</sup> A psychological interest theory similar to that of Professors Böhm-Bawerk, Fetter, and Fisher can be made to fit this situation

their holdings to men of family ambitions and large productive powers, or possibly some exchange would take place between mere spendthrifts and mere misers. Moreover, the phenomenon of true interest might exist in such a society to a very limited extent; if the income-bearing agents were subject to large and unpredictable fluctuations in value, there would doubtless be a tendency toward separation of the speculative from the investment element.

Next let us modify the hypothesis by supposing that productive agents can be added to by forces under human control and human efforts themselves, but *by completely specialized agencies only*; that the population itself is divided into two parts so that laborers who make productive agents are completely separated from those who make consumption goods, except for free exchange between them. A real, tho indirect and very limited convertibility will now exist. An increase in income-bearers will result from an increase in consumption goods offered in exchange for them, through the calling into use of agents or activities of agents which were previously sub-marginal; especially by bringing no-rent natural agents into use and paying laborers to work longer or harder. Such a process could not go far without greatly affecting the ratio of conversion and probably putting a stop to the exchange.

If the requisite motives were present (in the form, presumably, of a sufficient power in exchange over income-bearers) to induce the conversion, and if a sufficient amount of uncertainty were present to bring about the separation of the conversion from the production of the surpluses of consumption value, capital loans at interest would be common in the society just described. It scarcely need be pointed out that the "ideal rate," would be simply the percentage which

the income of the rent-bearers purchaseable with a given amount of value makes of the value itself. The "actual" rate would be reduced by the competitively established remuneration for the entrepreneur service of making the exchange and taking the "chance" (in one sense of that highly ambiguous word) on the future income (and value) of the rent-bearers purchased.

In actual society a much more complex set of conditions leads to substantially the same result. Rent-bearers are producible in part by the same labor and material agents used in making consumption goods, in part by different agencies. We now have a direct and practically unlimited effective convertibility of utility-bearers and income-bearers. An excess of the latter offered in exchange for the former can now *divert* those productive services common to the two uses<sup>1</sup> from the production of the one to that of the other. Of course at the same time it shifts the use margins of different kinds of material agents, and moves the margin of equality of reward and sacrifice in the case of labor, up and down accordingly. The ratio of convertibility under these conditions will be that of the *specific product* of the shifted productive services in one use to their *specific product* in the other. That is, a surplus of "value" offered in the market will buy in rent-bearers the specific product, when used to create rent-bearers, of the productive services (mainly labor) whose specific product the value so offered is.<sup>2</sup> And under ideal conditions the product of the rent-bearers so purchased will immediately be imputed back to the "capital" which led to their creation, as its own proper product. Under

<sup>1</sup> As these services are especially labor, we see the fundamental soundness of the classical view (followed by Professor Taussig) of treating capital as advances to laborers. The natural agents used in producing capital goods are mainly mines, quarries, and timber land, all virtually specialized.

<sup>2</sup> Whence it appears that in a second way the specific productivity theory of distribution is absolutely essential to a tenable theory of interest.

actual conditions its imputed product will be reduced by a small margin of entrepreneur's profit, as already emphasized.

This entrepreneur's profit cannot in fact be said to be "imputed" to the entrepreneur, or to be his "specific product" in quite the same sense that the contractual income is imputed as product to the agent which gets it. A similar "margin" will also separate the sum of the rents (including wages) imputed to the concrete agents in any successful establishment from the total income, or product, of the establishment as a unit. But these differentials are "in a way" the product of the entrepreneur, and we may for present purposes treat them as such, and say that the capital gets its own specific product, entire. With this small reservation, which to discuss here would carry us quite too far afield, we may treat as established the following proposition: *The rate of interest on any capital loan is the anticipated specific productivity ratio of the capital in question, when converted into rent-bearers by the diversion of productive services from other uses.*<sup>1</sup> The last part of the statement is explanatory and unessential.<sup>2</sup>

<sup>1</sup> I cannot omit all reference to the ingenious logic by which Professor Irving Fisher maintains that the productive loan is for the purpose of anticipating an increase in income and equalizing consumption (See *The Rate of Interest*, ch 13, §§ 3-6.) The alleged intermediate option is in fact rarely present to the mind of the borrower, and is generally non-existent. The typical business loan secures an *addition* to the resources of the borrower, indispensable to the carrying out of the project for which it is to be used. Let the reader picture if he can, the aspiring young business man serenely "informing" some king of finance that he is about to make an investment of a hundred thousand and would like to borrow the amount so as not to disturb the shape of his income stream!

Professor Fisher admits (p 250) that the investment is made "because the rate of return is greater than the rate of interest," which if followed out will lead to the view here maintained, the separation of the "product" of agents made with borrowed capital into the "product" of that capital and the "profit" on the conversion. His treatment of the high interest rate in new countries (ch 15, § 10) similarly fails to give product where product is due. The capital loan is manifestly indispensable to and actually secured for the purpose of creating the increase in income which he treats it as merely "anticipating."

<sup>2</sup> On page 295 it was stated that the method of analysis here employed "side-steps" the controversy over the valuation of productive agents. But it will be evident

#### IV. THE EQUILIBRIUM OF SUPPLY AND DEMAND IN RELATION TO THE CAPITAL MARKET

The proposition or "law" just laid down may seem to have the air of a final solution of the interest problem, leaving nothing more to be said. Its limitation as it stands is that it relates exclusively to a very short period of time. *If*, at any time, the inducements (including the rate of interest itself) are sufficient to attract surplus production of value, wealth or "money" to the loan market, it will be loaned at a rate equal to the product of the agents into which it can be converted (divided by the amount of value loaned). What remains to do is, in brief, to inquire what will happen next, to examine the probable trend of the interest rate in advancing time, other things being assumed constant. This part of the argument can best be presented in connection with a criticism of the application to the interest problem of the principle of the equilibrium of supply and demand used in explaining the value of commodities in general.

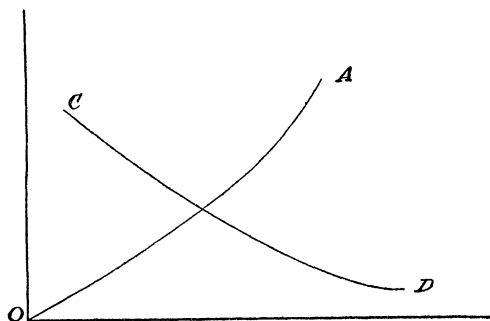
The first step will be to glance at this conventional diagram of equilibrium and to insist upon an obvious but neglected feature of its interpretation. The quanti-

to the thoughtful reader that it at the same time affords a complete solution of that problem. The exchange ratio can be none other (while conversion is possible) than the physical ratio of convertibility in the sense explained.

The cost of capital goods is another question similarly unnecessary to discuss under this method of attack. I may say dogmatically that the whole question of costs seems to me irrelevant in static analysis. In the static state, cost and value are merely different aspects of the same thing. Cost has meaning only in connection with changes in the productive organization. Under conditions where uncertainty is present, there may be said to be a real problem of costs, but it is merely the problem of profits. The problem of the distribution of costs is also real, of course, but it again is merely the problem of imputation.

The valuation of "none-reproducible capital goods" may also be dismissed by pointing out that they also go back to some human activity of preemption and development, and are not theoretically different from shorter-lived agents except in degree. Land value probably represents an investment of quite as much human pain as any other equally considerable category of value in the world.

ties represented by the abscissas of both curves are *rates* of supply and demand respectively, quantities which will be offered and taken *in a unit of time* at the prices indicated by the corresponding ordinates. Under ideal conditions a negligible amount of the commodity is in existence at any moment; that it is consumed as fast as produced is the fundamental assumption of equality of demand and supply (*rates* of demand and of



*Figure 1*

supply) underlying the analysis.<sup>1</sup> The situation is entirely different from that of a market where a fixed stock of goods must be sold, depicted by a diagram similar in appearance but in which the abscissas represent definite *quantities* of commodity.

It is not difficult to show the error in applying this analysis to the loan of capital, which is not continuously consumed in satisfying a constantly recurring want but added to an ever-growing stock, and each unit of which

<sup>1</sup> This was pointed out by Jevons, *Theory of Political Economy*, 3d ed (also 4th), p 64 Cited by Professor A A Young in this Journal, vol xxv, p 423 It has recently been insisted on by Hobson in *The Industrial Process and The Science of Wealth*

forever destroys the opportunity of using another unit in the same way. Perhaps the difficulty may most readily be brought out by referring to a recent standard exposition of the "eclectic" theory of interest, that of Professor Taussig's *Principles of Economics*. Referring to the diagram (reproduced herewith, see Figure 2) he says:<sup>1</sup>

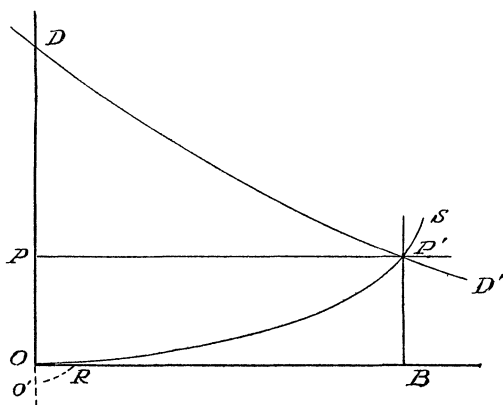


Figure 2.

The conditions of demand are indicated by the line DD, whose descending slope represents the diminishing productiveness of the several *installments* of capital. The ascending line ORS indicates the conditions of supply, — the increasing prices which must be paid in order to induce the several *installments* of savings which enable the capital to be forthcoming. . . . The rate of interest settles at a point where the marginal productivity [productivity of the marginal installment] suffices to bring out the marginal installment of saving." (Italics mine.)

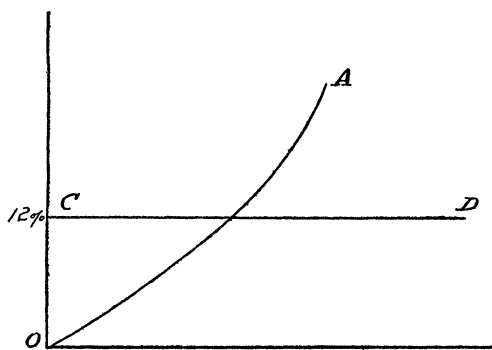
It requires no elaborate demonstration that the "installments" represented on these two curves are two entirely different sorts of things. That of capital is a

<sup>1</sup> Vol. ii, p. 23.



definite *amount*, that of saving a given *rate* of *continuous* accumulation; for however we formulate the motives or conditions of saving, the reaction to those conditions at any time (in a progressive society) is not a fixed amount of capital but a given rate of increase in the amount. Economists are confused by the practice of jumping in their value analysis from the discussion of the sale of a stock of goods in a market to the conditions of continuous demand and supply. Where the new factor of time comes in on both sides in the same way, no error results, and it is perhaps legitimate to simplify the exposition by making the transition without explanation. But the application to the interest problem is illicit because the time factor comes in in one of the curves and not in the other, one representing increments of a stock, the other increments of an increasing rate of supply of a stock. The ascending (supply) curve is, as already pointed out, a curve of *varying rates* at which capital will be forthcoming at varying market inducements in the form of interest. But the demand curve represents the return per unit which will be yielded by *successive amounts* of a total supply of capital. The one is applicable only to a given set of conditions, at a given moment, the other describes a given set of conditions and shows what will happen independently of time. The demand curve may be thought of as depicting the productivity per unit of an increasing stock of capital, but more simply from the present point of view, as merely the productivity rates possible in all the different investments open to the society in the beginning. As investment goes on, the better of these opportunities are used up in order, and at any moment the productivity of new investments is simply what it is, the rate of return in the best remaining opportunities.

Such curves have no relation whatever to each other, and their intersection means nothing at all. Two separate problems here call for analysis, the conditions obtaining at a particular moment, and the historic course of events or the trend of the interest rate in time, under static conditions.



*Figure 3.*

The first problem is very simply dealt with by a diagram, illustrating the verbal analysis given above (Part III). In the accompanying sketch (Figure 3), *OA* is the supply curve, showing, under the conditions obtaining at the time, the amount of capital per unit of time (say dollars per week) which will be, or rather would be, offered at different rates of interest.<sup>1</sup> The conditions of demand at the moment being simply the anticipated productivity of the next unit of investment, are to be represented by a horizontal line at the proper point. This might be 12 per cent, if the society were young and

<sup>1</sup> The reader who is still unconvinced after the discussion in Part II, may regard this as a psychological, or even as a time-preference curve, if he so insists, without affecting the present argument in any way

its environment favorable. The interest rate will then be fixed at this point, and the society will bring forward at the corresponding rate, whatever it may be, new capital for investment. We must suppose that new capital would be brought forward quite rapidly, but no rate of accumulation could affect the rate of return until an appreciable period of time had elapsed, an appreciable absolute amount of accumulation made, and an appreciable number of investment opportunities eliminated from the market.

There is here no equilibrium between supply and demand. An equilibrating action takes place, but it is of a different character. Instead of a variable rate of interest adjusting supply and demand to equality, it is the rate of accumulation which is variable, and it adjusts to equality the relative subjective estimate of the two classes of goods, (consumption goods and productive agents) on the one hand, and their physical ratio of conversion on the other. The rate of interest is fixed by technical productivity and the social reaction is a rate of accumulation which leaves its marginal estimates of utility-bearers and income-bearers in the same ratio as their physical conversion ratio.

Let us now consider what will happen in the next short interval of time. The capital saved and invested in the preceding interval will have changed the situation in *two* important respects. Not merely will a certain grade of investment opportunities have been used up — annihilated as far as present market conditions are concerned — but the income of the society will be increased by the return from these intervening investments.<sup>1</sup> The new situation may be represented (along with the old, shown in dotted lines) by the diagram of Figure 4. We

<sup>1</sup> Supposing that the elasticity of demand for capital is greater than unity, a perfectly safe assumption in view of the facts; it must be enormously high. In fact, the difficulty is with the exchange value concept and not with our reasoning in any case.

take an interval sufficiently long to show appreciable change — perhaps twenty years in such a society as referred to. The supply curve will now be reduced in slope, since the income of the society is greater than before, and it is easier to supply a given amount of surplus (whether out of production at large or by way of special production); we may, therefore, suppose that

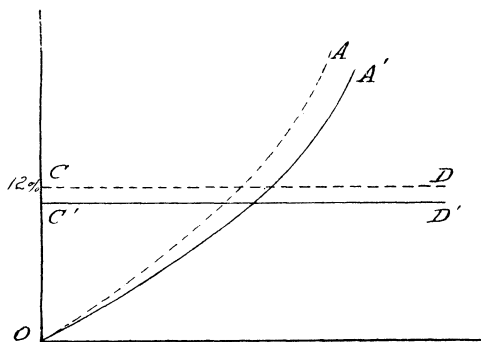


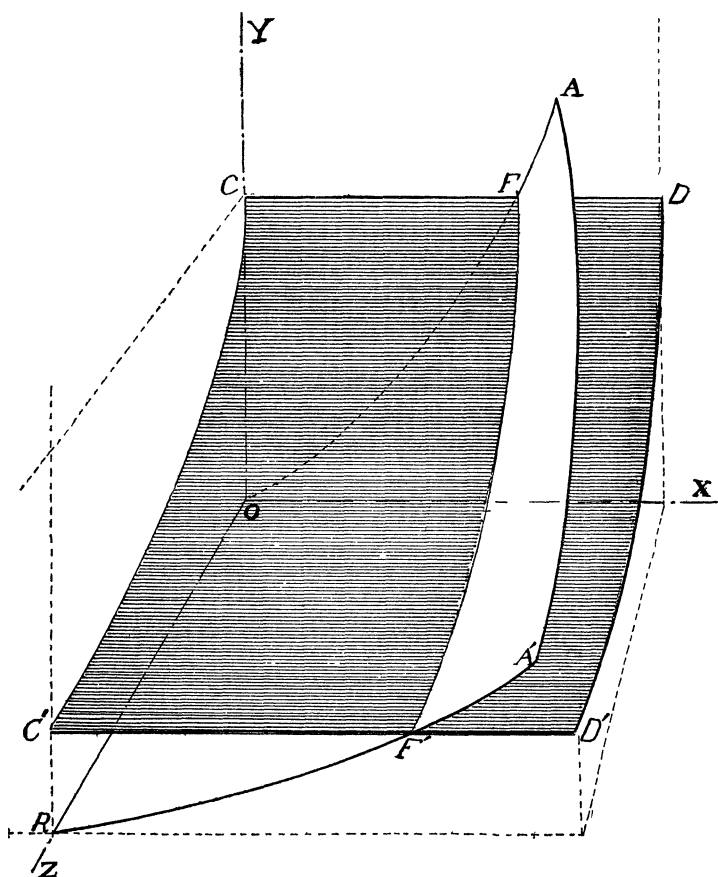
Figure 4.

the same level of return will call forth supply at a higher rate.<sup>1</sup> At the same time, the productivity being lower because not so good investment opportunities remain open, its line must be drawn below the former one, say at 11 per cent. The result is a lower rate of interest, but the rate of saving being influenced in opposite ways by the two changes (lowering of both inducement and sacrifice) its change will be only the difference between the two effects. We may suppose it about the same as before.

<sup>1</sup> The connection between rate of return and actual inducement to accumulation is so delicate and uncertain that this assumption is somewhat open to question, but it seems probable on the whole.

To represent the trend of the interest rate through a long period of time, three dimensions are required. A row of diagrams similar to those just discussed are

*Figure 5.*



strung out along a time-axis perpendicular to the plane of the paper, with the result shown in Figure 5. As the plane of the diagram of Figure 3 is moved along the time-axis OZ, the horizontal (productivity or rate

of interest) line constantly descends, but at a decreasing velocity, generating the inclined, curved surface CDC'D'. The capital supply curve OA flattens down as it moves forward, generating the spirally warped surface OARA'. Any cross-section of the two surfaces perpendicular to OZ represents the condition at the corresponding moment of time, and has the form of Figure 3. The line of intersection of the two surfaces, FF' is a historic curve for both sets of data. Its Z-values show the time, its X-values the rate of accumulation (approximately constant) and its Y-values the rate of interest (constantly falling).

A word must be said as to the static assumption in regard to other conditions. Confusion with Professor Clark's conception of the static state is particularly to be avoided. Any accumulation of capital would itself be a violation of his postulates. But are such postulates permissible? Can we assume, consistently with natural possibility, a total set of conditions to be static when if part of them are so others cannot be? Apparently the only things we have a right to *assume* as constant are the natural environment of the society and the essential characteristics of the population itself. In particular, its *tastes* (in the most inclusive sense) must not change, and its *knowledge* must not grow. Changes necessarily resulting from the reaction of a static population to a static environment cannot be eliminated by legitimate hypothesis, and it seems clear that a progressive accumulation of capital and fall in the interest rate must be conceded to come in this class.

Will this process go on forever, or where will it stop? The answers to these questions would depend on the assumptions, but we may speculate on the case of an actual society — say the United States, if environment

and population were to be held constant as they now are. On the demand side, the opportunity for investment of new capital at very low rates of interest without any addition to present knowledge of means of production or modes of consumption or change in the tastes of the people, seems practically unlimited.<sup>1</sup> On the supply side, conjecture is more hazardous. We know that much accumulation would take place even at an expense to the savers. As to the conditions under which accumulation once made is "eaten up" by the failure to maintain productive property, almost nothing is known. Moreover, the principal inducements to accumulation, the non-economic sociological motives, would inevitably change as the process went on. Perhaps it is also illegitimate to assume the human factor in the situation as constant, when the derived factor of social conditions undergoes such profound modifications. Possibly as reasonable a guess as any would be that if conditions suddenly became "as static as possible," the interest rate would fall for a long time in the future — due largely to the force of the saving habit — and finally be brought to a stationary condition by inevitable social changes.

In actual history, it is superfluous to remark, the interest rate has been held up by improvements in the arts, together with the growth of population and of individual wants — all resulting in new opportunities for the investment of capital or its conversion into productive agents. This phase of the subject can also

<sup>1</sup> A different view has been expressed by Professor Taussig, who also shows agreement with much of the position here maintained (See this Journal, vol xxii, p 357) After asserting that "the 'static state' . . . means a condition in which the arts are stationary" (the present view exactly) he goes on to say that "an increase of capital, in such a state, means an addition of tools and materials of the same kind that were used before" It seems to me that we must say rather "of kinds that were known before to be available" For indications of the general line of argument here developed see the same article, p 355, and his *Principles of Economics*, vol ii, p 27, also Marshall's *Principles*, p 534 (6th ed.).

be represented on the three-dimension diagram by a slight modification. The productivity surface OARA' (Figure 5), instead of sloping downward in time, requires but to be raised to a level, or even above, or given whatever undulations are necessary to express actual conditions at the different points of time.

When the process did finally come to a term, if it ever did, and a stable or "static" rate of interest came to prevail, conditions of equilibrium would be present; a diagram similar to the conventional one could then be made to fit the situation, tho the interpretation would be somewhat different. But in a progressive society, such as economic science is now interested in, the equilibrium is of a wholly different character, the rate of accumulation and not the rate of interest being the equilibrating variable. As far as the interest rate is concerned, the conditions of demand completely dominate the situation at all times and the conditions of supply make themselves felt only through changes in the conditions of demand resulting from the actual workings of new supply.<sup>1</sup>

If a time ever came when sufficiently favorable opportunities of investment did not exist (or the sociological motives were too weak) to bring forth an excess of value production over consumption, then the supply curve would not intersect the productivity line (in its positive portion) and the principles discussed above would be inapplicable. If the point of zero accumulation were actually above the productivity level, there might be a tendency to the reverse "conversion" by failure to maintain capital goods. Hence it may be correct, in a sense, to say with the "eclectics" that interest "tends

<sup>1</sup> The situation is similar in essential respects to that of the valuation of gold, or rather what the latter would be like if gold were the only money and were itself used exclusively as money. Gold, like capital, is not consumed, but accumulated. See Taussig, *Principles*, Chapter 19, for a clear exposition of this case.



toward " such an " equilibrium level." But we can surely give the phrase " normal interest " a more significant interpretation than this far-off and wholly hypothetical situation affords. The normal rate of interest at any time with which we are concerned has been, is, and will be, the anticipated productivity of the next unit of capital investment at the time under consideration.<sup>1</sup>

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<sup>1</sup> A similar " equilibrium level " may be imagined in the case of gold, when its value would just call forth new supply sufficient to replace abrasion and loss. And this " equilibrium level " would be as significant for the problem of the value of money as that for capital is for any problem in which living men are interested, that is, hardly at all.